

ABSTRACT OF THE DISCLOSURE

The orientation ratio of a crystalline semiconductor film obtained by crystallizing an amorphous semiconductor film through heat treatment and irradiation of intense light such as laser light, ultraviolet rays, or infrared rays is enhanced, and a 5 semiconductor device whose active region is formed from the crystalline semiconductor film and a method of manufacturing the semiconductor device are provided. In a semiconductor film containing silicon and germanium as its ingredient and having a crystal structure, the {101} plane reaches 30% or more of all the lattice planes detected by Electron backscatter diffraction. This semiconductor film is obtained by forming an amorphous 10 semiconductor film containing silicon and germanium as its ingredient through plasma CVD in which hydride, fluoride, or chloride gas of a silicon atom is used, the repetition frequency is set to 10 kHz or less, and the duty ratio is set to 50% or less for intermittent electric discharge or pulsed electric discharge, and introducing an element for promoting crystallization of the amorphous semiconductor film to the surface thereof to crystallize the 15 amorphous semiconductor film while utilizing the introduced element.